



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,988	02/02/2005	William Leslie Barnes	124-1104	4650
23117	7590	10/11/2006	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			KALAM, ABUL	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/522,988

Applicant(s)

BARNES ET AL.

Examiner

Abul Kalam

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Objections*

1. Claims 2-10 are objected to because of the following informalities:

In line 1 of claims 2-10, the limitation "A device" should be amended to recite --  
The device -- to avoid antecedent basis issues.

Claim 2, in line 8, recites the limitation "the metal comprising electrode/air interface." There is insufficient antecedent basis for this limitation in the claim. The Office will interpret this limitation as "an interface between the metal comprising electrode and air."

Claim 3 recites the limitation "the electrode" in line 3. In line 1 of claim 1, applicant claims two electrode structures, and then in line 2 of claim 1 applicant claims that at least one of the electrodes is substantially metal comprising and at least semi-transparent. Is the electrode in line 3 of claim 3, the metal comprising electrode or the other electrode?

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 2814

2. **Claims 1, 2, 5-7 and 9** are rejected under 35 U.S.C. 102(e) as being anticipated by **Scherer et al. (US 6,534,798)**.

With respect to **claim 1**, **Scherer** teaches (**FIGS. 1-3**) an optoelectronic device comprising:

a semiconductor layer (**12**) sandwiched between electrode structures (**18 and 22**), wherein at least one of the electrodes (**22**) is substantially metal comprising and at least semi-transparent, a periodic microstructure (**col. 5: Ins. 32-41**) in contact with at least one surface of the substantially metal comprising and at least semi-transparent electrode (**22**) (**col. 4: Ins. 23-67; col. 5: Ins. 1-50; col. 6: Ins. 44-59**).

characterized in that the structure and positioning of the periodic microstructure is such that: surface plasmon (SP) polariton modes supported mainly at the interface between the dielectric layer or semiconductor layer and the metal comprising, semi-transparent electrode are substantially scattered into propagating light, said propagation being out of the plane of the dielectric layer or semiconductor layer and the metal comprising, semi-transparent electrode interface (**col. 1: Ins. 57-67; col. 2, Ins. 1-5; col. 4: Ins. 23-39;**).

With respect to **claim 2**, (*as best interpreted by the Office*) **Scherer** teaches the device according to claim 1, as set forth above wherein the periodic microstructure is a grating type structure present at the metal comprising electrode/air interface only (**col. 6: Ins. 44-59**).

With respect to **claim 4**, **Scherer** teaches the device according to claim 1, as set forth above, wherein the periodic microstructures are a periodic sequence of valleys and

Art Unit: 2814

hills, or a periodic sequence of grooves ("**one dimensional grating**," col. 5: Ins. 32-41).

With respect to **claim 5**, **Scherer** teaches the device according to claim 1, as set forth above, wherein the periodic microstructures are a grating type structure, which is a series of holes in the metal comprising electrode ("**a square array of holes**," col. 5: Ins. 32-41).

With respect to **claim 6**, **Scherer** teaches the device according to claim 1, as set forth above, wherein the periodic microstructures are periodic in more than one direction on the surface ("**two dimensionally periodic structure**," col. 1: Ins. 63-67; col. 2: Ins. 1-5).

With respect to **claim 7**, **Scherer** teaches the device according to claim 1, as set forth above, wherein the periodic microstructures are sub-wavelength (col. 8: Ins. 39-54; col. 16: Ins. 56-58).

With respect to **claim 9**, **Scherer** teaches the device according to claim 1, as set forth above, wherein the device is a light emitting diode (col. 1: Ins. 57-67).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2814

**3. Claims 3, 8 and 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Scherer et al. (US 6,534,798)**, as applied above to claims 1, 2 or 9, respectively, and further in view of **Arnold et al. (US 2004/0012328)**.

With respect to **claim 3**, (*as best interpreted by the Office*) **Scherer** teaches the device according to claim 2, as set forth above in claims 1 and 2, including wherein the periodic microstructure is selected from a grating type structure present at the metal comprising electrode/air interface only (**col. 6: Ins. 44-59**).

Thus, **Scherer** teaches all the limitations of claim 3 with the exception of explicitly disclosing: wherein there is present an encapsulating layer on the electrode.

However, **Arnold** teaches a optoelectronic device with periodic microstructures wherein an encapsulating layer (**32**) is formed on the electrode (**30**) to protect the electrode and the underlying layers (**pg. 2: [0022]**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of **Scherer** with the teaching of **Arnold**, to form an encapsulating layer on the electrode for the disclosed intended purpose of the protecting the electrode and the underlying layers (**pg. 2: [0022]**).

With respect to **claim 8**, **Scherer** teaches all the limitations of the claim, as set forth above in claim 1, with the exception of disclosing: wherein the metal comprising electrode is an aluminum cathode.

However, **Scherer** discloses wherein the metal comprising electrode is silver (**col. 6, Ins. 46-48**). **Arnold** teaches an optoelectronic device wherein the metal comprising electrode can be a silver cathode or an aluminum cathode (**pg. 6: [0105]**).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of **Scherer** with the teaching of **Arnold**, because substituting aluminum for silver would have been considered a mere substitution of art recognized equivalent materials (MPEP 2144.06).

With respect **claim 10**, **Scherer** teaches all the limitations of the claim as set forth above in claim 9, with the exception of disclosing: wherein the light emitting diode is an organic light emitting diode.

However, **Arnold** teaches that organic light emitting diodes are well known in the art (**pg. 1: [0006]-[0010]**). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of **Scherer** to form an organic light emitting diode, as taught by **Arnold**, because organic light emitting diodes are well known in the art.

### ***Conclusion***

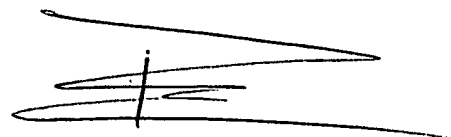
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abul Kalam whose telephone number is 571-272-8346. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Abul Kalam



THAO X. LE  
PRIMARY PATENT EXAMINER

02 Oct 06